

Appendix C: Summary of Trail Condition

| <u>DESCRIPTION</u> | <u>Miles</u> | <u>Assessment</u> |
|------------------------------|---------------------|--------------------------|
| Education Center Trail | 0.63 | Fair |
| Elephant Seal Overlook Trail | 0.2 | Replace |
| Out Road Trail | 1.4 | Fair |
| Alamea Trail | 1.5 | Fair |
| Ridge Trail | 6.4 | Fair |
| Coast Trail – South | 8.5 | Fair |
| Coast Trail – North | 4.2 | Fair |
| Glen Trail | 1.4 | Fair |
| Mt. Wittenberg Trail | 2.5 | Fair |
| Sky Trail | 4.4 | Fair |
| Fire Lane Trail | 3.27 | Poor |
| Pablo Point Trail | 1.0 | Fair |
| Teixeira Trail | 1.91 | Fair |
| Olema Valley Trail | 4.5 | Poor |
| Bolema Trail | 1.07 | Poor |
| Lake Ranch Trail | 2.99 | Fair |
| Crystal Lake Trail | 2.95 | Replace |
| Greenpicker Trail | 3.7 | Poor |
| Glen Loop Trail | 0.9 | Fair |
| Baldy Trail | 1.1 | Replace |
| Old Pine Trail | 1.8 | Fair |
| Meadow Trail | 1.6 | Poor |
| Horse Trail | 3.21 | Replace |
| Inverness Ridge Trail | 1.6 | Fair |
| Bayview Trail | 3.2 | Poor |
| Bucklin Trail | 2.32 | Poor |
| Limantour Beach Trail N. | 0.26 | Fair |
| Limantour Beach Trail S. | 0.25 | Fair |
| Rift Zone Trail | 1.73 | Poor |
| Tomales Point Trail | 4.6 | Poor |
| Palomarin Beach Trail | 0.62 | Fair |
| Woodpecker Trail | 0.5 | Fair |
| Earthquake Trail | 0.5 | Fair |
| Woodward Valley Trail | 2.0 | Poor |
| LH - Sea Lion Overlook | 0.01 | Replace |
| Estero Trail | 8.3 | Poor |
| Chimney Rock Trail | 0.9 | Fair |
| Abbotts Lagoon Trail | 1.1 | Poor |
| Lighthouse Trail | 0.1 | Poor |
| Morgan Trail | 0.6 | Fair |
| McClures Beach Trail | 0.4 | Fair |
| Laguna Trail | 2.2 | Poor |
| Drakes View Trail | 2.0 | Poor |
| Hidden Valley Trail | 0.48 | Poor |

| <u>DESCRIPTION</u> | <u>Miles</u> | <u>Assessment</u> |
|--|---------------------|--------------------------|
| Z Ranch Trail | 0.7 | Fair |
| Alamere Falls Trail | 0.39 | Replace |
| Double Point Trail | 0.44 | Replace |
| Bear Valley Trail | 0.9 | Fair |
| McCurdy Trail | 2.0 | Poor |
| Kehoe Beach Trail | 0.6 | Poor |
| Ocean Lake Trail | 1.1 | Poor |
| Coast/Glen Spur Trail (South) | 0.4 | Fair |
| Kelham Beach Trail | 0.1 | Replace |
| Sculptured Beach Trail | 0.2 | Poor |
| Glenbrook Trail | 0.7 | Poor |
| Sunset Beach Trail | 1.4 | Replace |
| Drakes Head Trail | 1.6 | Replace |
| Muddy Hollow Trail | 1.4 | Replace |
| Muddy Hollow Trail | 2.0 | Replace |
| Sunset Overlook Trail | 0.19 | Poor |
| Tomales Bay Trail | 1.7 | Poor |
| Pierce Ranch Trail | 0.22 | Poor |
| Kule Loklo Trail | 0.51 | Fair |
| White Gate Trail | 0.9 | Poor |
| Bull Point Trail | 1.77 | Poor |
| Coast/Glen Spur Trail (North) | 0.3 | Fair |
| Bolinas Ridge Trail (maintained as a road) | 11.10 | Poor |
| Randall Trail (maintained as a road) | 1.6 | Poor |
| Stewart Trail (maintained as a road) | 5.4 | Poor |
| Jewell Trail (maintained as a road) | 0.9 | Fair |

Fair-

Trail Grade: Greater than 50% of a trail at a 5-10% grade

Alignment or type of construction: Greater than 50% of trail side-hill construction (i.e. trail alignment parallel to contour lines.) Trail constructed above wet areas.

Erosion: Developed trench in trail 0-6 inches deep.

Trail width, erosion surface area: 8 feet or less.

Water crossings: Bridges or rocked water crossings.

Poor-

Trail grade: 50% of a trail at 5-10% grade, 50% at a 10% grade and above.

Alignment or type of construction: Less than 50% of trail side-hill construction (i.e. trail alignment parallel to contour lines) 50% through-cut construction (i.e. trail alignment perpendicular to contour lines.)

Erosion: Developed trench in trail 6-12 inches deep.

Trail width, erosion surface area: 8-16 feet

Water crossings: Culverts or non-hardened, eroding unimproved streambeds

Replace

Trail grade: Less than 50% of trail at a 5-10% grade, greater than 50% at 10% above

Alignment of construction: Less than 50% of a trail side-hill construction (i.e. trail alignment parallel to contour lines.) Greater than 50% thorough cut construction (trail alignment perpendicular to contour lines.)

Erosion: Developed trench in greater in trail greater than 12 inches deep.

Trail width, erosion surface area: Greater than 16 feet.

Water crossings: Older culverts or non-hardened, eroding unimproved streambeds.

| Asset Condition | # of Trails | % Trails | Miles of Trail | % of Trail Mileage |
|------------------------|--------------------|-----------------|-----------------------|---------------------------|
| Fair | 29 | 41.4% | 48.87 | 36.70% |
| Poor | 29 | 41.4% | 69.65 | 52.20% |
| Replace | 12 | 17.2% | 14.80 | 11.10% |

Appendix D: Definitions

Road to trail conversion “Many trails within parks are developed on legacy roads that were constructed before the area became public land. Early park managers found it was much easier to let a road close in with vegetation and become a trail, than to construct a new trail. Where roads did not connect, short trail segments were often built to link the roads into a trail network. Unfortunately, poorly constructed roads make poor trails. Grades are often excessive and many of these roads continue to be sources of sediment and erosion problems. Roads that are unsuitable as trails are removed by full recontouring or decommissioning. Where roads do provide a stable alignment, the road can be converted to a trail. Conversion greatly reduces erosion problems and provides park visitors with a more pleasant hiking experience.

A road-to-trail conversion transforms an existing road into recreational trail using heavy equipment. The process begins by removing encroaching vegetation from the road way and stock piling it nearby. Then the bulldozer rips the inboard ditch and inboard road surface to reduce ditch memory and increase the permeability of the roadbed. Once the roadbed is prepared, embankment fill is excavated from the outboard edge of the road and placed against the cutbank. Between the excavated fill and the cutbank fill a 5-foot wide portion of the original road is preserved and will serve as the trail tread. The trail should be located on the cut bench of the road, not on the embankment fill. This ensures the trail is on stable well-compacted material. The trail can be constructed with gentle meanders to soften the appearance of a straight road section.” Ditch memory is when the water flowing under ground is diverted down a covered ditch because of its compaction this prevents the water from moving naturally down slope.

(Note: This description comes from “ Field Techniques for forest and range road removal California State Parks North Coast Redwoods District Roads, Trails and Resources Maintenance”)

Out-slope- On trails routed generally parallel to the contour lines of a slope where the cross section is tipped inward, this term describes the process of reversing that direction, usually accomplished by moving soil from the outside edge of the trail to the inside. This technique is recommended only with road to trail conversion.

Through-cut trail- Generally considered the most negative type of construction; it is used in cases where the trail is routed perpendicular to the contour lines. In such cases out-sloping is impossible and the trail carries water throughout its through-cut length. Depending on the steepness of the slope, this deficiency can produce extraordinary erosion impossible to fully control. It is frequently the reason for rerouting or obliterating trails.

Reroute- This term is usually proposed to alleviate steep gradients and through-cut situations and to avoid wet areas or natural resources of particular concern. In the context of this report, a recommendation to reroute a trail segment also implies the need to restore the abandoned route to natural conditions, including grading to original contours and re-vegetation (except in the case of historically significant routes). All reroutes should employ a multidisciplinary

approach to determine alignments. Major reroutes should employ GIS technology to assist planners in selecting the most desirable alignments.

Remove culverts- This is frequently done in concert with other measures and is always intended to help dissipate and slow surface flow of water. Bridges and wet crossings often offer more desirable alternatives where concentrations of water must be carried across the trail. This is a particularly important prescription for the requirements of anadromous fish and other aquatic species.

Remove berms- Berms are embankments along the outside edges of roads intended, like ditches, to channel water in the direction of the route to be eventually intercepted by culverts, water bars or dips. Again this action is intended to disperse the flow of water, allowing it to move off the trail surface in sheets. This recommendation is only appropriate under the terms defined above “Road To Trail” conversion.

Add structures- Establishing and maintaining a trail often requires the introduction of structures to compensate for steep gradients or to keep trail surfaces and users dry. The following are most commonly used:

Drainage dips

Stairs

Retaining walls

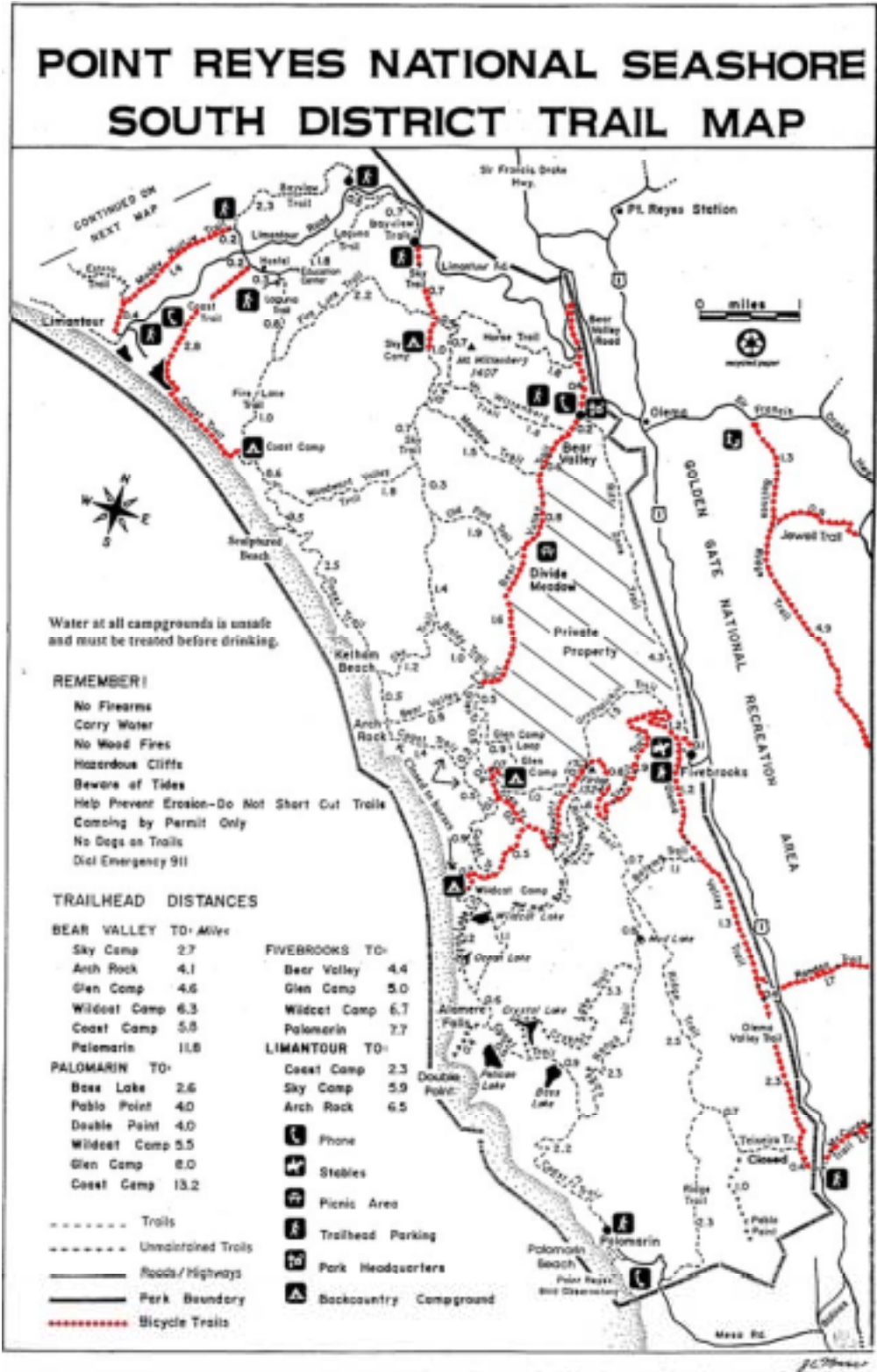
Boardwalks

Bridges

Rock fill

Turnpikes- (a trail elevated in a wet area by an embankment of stable but porous material that allows some water movement while keeping the trail surface dry)

Appendix E: Current Park Trails Maps



Appendix F: Marin Municipal Water District MOU

MEMORANDUM OF UNDERSTANDING

**Among the
MARIN MUNICIPAL WATER DISTRICT,
COUNTY OF MARIN,
MARIN COUNTY OPEN SPACE DISTRICT,
CALIFORNIA DEPARTMENT OF PARKS AND RECREATION,
NATIONAL PARK SERVICE, and
MARIN COUNTY RESOURCE CONSERVATION DISTRICT
For
MAINTENANCE AND MANAGEMENT OF UNPAVED ROADS
IN THE LAGUNITAS CREEK WATERSHED**

This Memorandum of Understanding, dated October 29, 2001, is by and between the Marin Municipal Water District (MMWD); the County of Marin (County), acting through the Marin County Board of Supervisors (Supervisors), Marin County Fire Department (MCFD), Marin County Department of Public Works (DPW), and Marin County Community Development Agency (MCCDA); the Marin County Open Space District; the California Department of Parks and Recreation (State Parks); the National Park Service (NPS); and the Marin County Resource Conservation District (MCRCD).

RECITALS

WHEREAS the parties to this Memorandum of Understanding (hereafter “Agreement”) own, manage, or have an interest in the management of lands and waters within the 103-square mile Lagunitas Creek watershed, the largest watershed in Marin County; and

WHEREAS Lagunitas Creek and some of its tributaries support populations of threatened and endangered species per the federal and state Endangered Species Acts, including coho salmon, steelhead trout, California freshwater shrimp, and California red-legged frog; and

WHEREAS streambed sedimentation is one of the main factors constraining habitat values for coho salmon and steelhead trout using Lagunitas Creek and its tributaries for spawning, rearing, and migration; and

WHEREAS the supply of fine sediments has been linked to erosion throughout the watershed with unpaved roads having been identified as one of the most significant causes of erosion and a direct source of fine sediment; and

WHEREAS all parties to this Agreement recognize that proper maintenance and management of unpaved roads under their ownership, jurisdiction, or influence within the Lagunitas Creek watershed can reduce streambed sedimentation and thereby enhance habitat for coho salmon, steelhead trout, and California freshwater shrimp; and

WHEREAS it is the goal of all parties to this Agreement to enhance coho salmon, steelhead trout and California freshwater shrimp habitat within the Lagunitas Creek watershed,

particularly, but not exclusively, those portions of the watershed downstream of Kent Lake and Nicasio Reservoir, by maintaining and managing unpaved roads, or encouraging the maintenance and management of unpaved roads, to minimize soil loss, reduce erosion potential, and reduce the amount of sediments entering Lagunitas Creek, while accommodating the appropriate uses designated for these roads; and

WHEREAS it is the goal of all parties to this Agreement to manage and maintain unpaved roads in a condition that will allow for use of these roads during emergency situations with minimal damage or wear that could increase erosion; and

WHEREAS it is the intent of all parties to this Agreement to encourage a cooperative relationship among the parties to implement a consistent approach to the maintenance and management of unpaved roads in the Lagunitas Creek watershed; and

WHEREAS all parties to this Agreement acknowledge that funding constraints could affect implementation of the desires expressed in this Agreement and that implementation of this Agreement's terms could be altered, delayed, limited or even prevented if funding sources are not identified or made available.

AGREEMENT

NOW, THEREFORE the parties to this Agreement agree to:

1. Model road maintenance and management activities as set forth in the document entitled: *Guidelines for the Maintenance and Management of Unpaved Roads in the Lagunitas Creek Watershed* (Attachment A), including the manuals referenced in that document, and as may be amended from time to time. In addition, the parties may adopt other manuals or handbooks by consensus to augment or replace the above guidelines and/or manuals as deemed necessary.
2. Implement the actions in this Agreement in compliance with all applicable federal, state, and local environmental laws and regulations.
3. Acknowledge the fact that nothing in this Agreement negates any laws, regulations, or policies.
4. Act consistently with this Agreement when developing policies, plans, or projects; when exercising regulatory authority, or conducting environmental review; or when otherwise conducting work related to unpaved roads in the Lagunitas Creek watershed; and to encourage others to do so.
5. Provide the other parties to this Agreement with information relevant to unpaved road management in the Lagunitas Creek watershed. This may include maps and data about individual roads, internal policies for road maintenance and/or management, and training or other educational information.
6. Strive to inspect, on an annual basis, all actively used, unpaved roads on public lands, and encourage or assist, when requested, with inspections on private lands, for the

purpose of identifying where routine maintenance or repairs are needed; and undertake routine maintenance in a timely manner as resources permit.

7. Meet, at least annually, to discuss the status of each agency's efforts, singly and cooperatively to reduce road-related sedimentation in the Lagunitas Creek watershed; to review existing, or consider new sediment reduction techniques; to coordinate grant-funding requests; and to discuss other matters pertinent to fulfilling the purpose of this Agreement.
8. Identify and map the entire system of unpaved roads subject to this Agreement, designating each road according to its categories of use and whether the road is actively used, unneeded, or abandoned. The mapping and designation of roads on private property will only be accomplished with the voluntary cooperation of the landowner. This mapping will be updated annually as necessary.
9. Identify non-routine repairs and long-term sediment reduction projects on each agency's actively used unpaved roads that are not funded within each agency's annual maintenance budget.
10. Identify unneeded and abandoned roads and consider such roads for closure or conversion to recreational trails; and coordinate the closure or conversion of such roads in those situations where roads cross property boundaries and pass from one ownership to another, or provide access to another agencies facilities.
11. Develop strategies, and identify funding mechanisms, to accomplish specific non-routine repairs or long-term sediment reduction projects on actively used unpaved roads, by means of phasing, sharing staff or equipment, and cooperative grant-seeking.
12. Develop strategies, and identify funding, to accomplish specific road closures or conversions, by means of phasing, sharing staff or equipment, and cooperative grant-seeking.
13. Make a good faith effort to implement long-term repairs and closures or conversions, recognizing each agency's budget constraints and other land management responsibilities and priorities.
14. Strive to meet the schedule of milestones for road maintenance and management in the Lagunitas Creek watershed as indicated in Table 1 (attached) of this Agreement.
15. Recognize that the terms of this Agreement are subject to the availability of funding, personnel and other essential resources, and that each party has the sole authority and responsibility regarding decisions and matters in its own jurisdiction.
16. This Agreement has no termination date and may be revised as necessary. Each party to this Agreement may withdraw from this Agreement upon written notice to all other parties.

The parties agree that this Agreement does not constitute any legal admission or opinion as to the subject matter, nor does it confer any additional legal rights, liabilities or obligations between the parties or to third parties that do not already exist in law.

Marin Municipal Water District

Signed

President, Board of Directors
Attest:

County of Marin

Signed

President, Board of Supervisors
Attest:

California Department of Parks and Recreation

Signed

Superintendent, Marin District Parks
Attest:

National Park Service

Signed

Superintendent, Point Reyes NS
Attest:

**Marin County Resource Conservation District
District**

Signed

President, Board of Directors
Attest:

Marin County Open Space

Signed

President, Board of Directors
Attest: